SL-3GHD128128-RC

VikinX Sublime 128x128 3G/HD/SD-SDI Router

User manual

Rev. 0

Nevion Support

Nevion Europe

P.O. Box 1020
3204 Sandefjord, Norway

Support phone 1: +47 33 48 99 97
Support phone 2: +47 90 60 99 99

Nevion USA

1600 Emerson Avenue
Oxnard, CA 93033, USA

Toll free North America: (866) 515-0811
Outside North America: +1 (805) 247-856

E-mail: support@nevion.com
See http://www.nevion.com/support/ for service hours for customer support globally.

Revision history

Current revision of this document is the uppermost in the table below.

Rev.	Repl.	Date	Sign	Change description
0	-	2012-02-20	NBS/AAA	First release.

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1 Product overview

Nevion proudly presents Sublime SL-3GHD128128-RC. With this router, Nevion continues a stable and proven product line including the most complete signal format and size offering available.

With the ultra slim, multi format and flexible product range, Sublime fulfils the most demanding requirements from the professional broadcast market.

This User Manual presents the features, installation and operation procedures of the SL-3GHD128128-RC router of the Sublime range.

The key features of SL-3GHD128128-RC are:

- Multi rate support; 3G/HD/SD-SDI
- Supports DVB-ASI
- Supported bitrates: 270Mbps - 3Gbps
- Reclocking on standard 3G/HD/SD-SDI signals. Reclockers may be turned off, for support of E4/STM-1e
- TCP/IP, RS-232 and NCB control interfaces
- Hot pluggable optics (on variants with optical I/O)
- Software based Configurator for easy system set-up
- Ultra Slim frame depth
- Low Power consumption; high reliability design
- Redundant power supply system with front indicators
- Interoperability with existing VikinX routers
- Future proof and flexible product range

VikinX Sublime provides many of the powerful control features that drove the VikinX Modular range to success. VikinX Sublime is ideal for general purpose facilities, on-air routing, mobile outside broadcast applications and sophisticated A/V applications.

VikinX Sublime router series provides most important 3rd party control interfaces, allowing the control of our routers through 3rd party management software. This enables you to utilize existing routers and management systems from other manufacturers and still draw the advantages of implementing VikinX Sublime in your routing application.

1.1 Product variants

There are a number of variants for this product. They all share the same hardware, and are distinguished by FW keys.

Item	Description
SL-3GHD128128-RC	128x128 HD-SDI Router (Multi rate, 270Mbps-2.970Gbps). Supports 3G-SDI, HD-SDI, SD-SDI, DVB-ASI. Ethernet/RS-232/NCB control. 19" 8RU depth 5cm.
SL-3GHD128128-RC-16OPT	128x128 HD-SDI Router (Multirate, 270Mbps-2.970Gbps). Specs as for SL-3GHD128128-RC, but with 16 Optical I/O and 112 Electrical I/O.
SL-3GHD128128-RC-32OPT	128x128 HD-SDI Router (Multirate, 270Mbps-2.970Gbps). Specs as for SL-3GHD128128-RC, but with 32 Optical I/O and 96 Electrical I/O.
SL-3GHD128128-RC-48OPT	128x128 HD-SDI Router (Multirate, 270Mbps-2.970Gbps). Specs as for SL-3GHD128128-RC, but with 48 Optical I/O and 80 Electrical I/O.
SL-3GHD128128-RC-64OPT	128x128 HD-SDI Router (Multirate, 270Mbps-2.970Gbps). Specs as for SL-3GHD128128-RC, but with 64 Optical I/O and 64 Electrical I/O.
SL-3GHD128128-RC-80OPT	128x128 HD-SDI Router (Multirate, 270Mbps-2.970Gbps). Specs as for SL-3GHD128128-RC, but with 80 Optical I/O and 48 Electrical I/O.
SL-3GHD128128-RC-96OPT	128x128 HD-SDI Router (Multirate, 270Mbps-2.970Gbps). Specs as for SL-3GHD128128-RC, but with 96 Optical I/O and 32 Electrical I/O.
SL-3GHD128128-RC-112OPT	128x128 HD-SDI Router (Multirate, 270Mbps-2.970Gbps). Specs as for SL-3GHD128128-RC, but with 112 Optical I/O and 16 Electrical I/O.
SL-3GHD128128-RC-128OPT	128x128 HD-SDI Router (Multirate, 270Mbps-2.970Gbps). Specs as for SL-3GHD128128-RC, but with 128 Optical I/O.
SL-3GHD96128-RC	96x128 HD-SDI Router (Multi rate, 270Mbps-2.970Gbps). Supports 3G-SDI, HD-SDI, SD-SDI, DVB-ASI. Upgradeable to 128x128. Ethernet/RS-232/NCB control. 19" 8RU depth 5cm.
SL-3GHD12896-RC	128x96 HD-SDI Router (Multi rate, 270Mbps-2.970Gbps). Supports 3G-SDI, HD-SDI, SD-SDI, DVB-ASI. Upgradeable to 128x128. Ethernet/RS-232/NCB control. 19" 8RU depth 5cm.
SL-3GHD64128-RC	64x128 HD-SDI Router (Multi rate, 270Mbps-2.970Gbps). Supports 3G-SDI, HD-SDI, SD-SDI, DVB-ASI. Upgradeable to 128x128. Ethernet/RS-232/NCB control. 19" 8RU depth 5cm.
SL-3GHD12864-RC	128x64 HD-SDI Router (Multi rate, 270Mbps-2.970Gbps). Supports 3G-SDI, HD-SDI, SD-SDI, DVB-ASI. Upgradeable to 128x128. Ethernet/RS-232/NCB control. 19" 8RU depth 5cm.
SL-3GHD32128-RC	32x128 HD-SDI Router (Multi rate, 270Mbps-2.970Gbps). Supports 3G-SDI, HD-SDI, SD-SDI, DVB-ASI. Upgradeable to 128x128. Ethernet/RS-232/NCB control. 19" 8RU depth 5cm.

Item	Description
SL-3GHD12832-RC	128x32 HD-SDI Router (Multi rate, 270Mbps-2.970Gbps). Supports 3G-SDI, HD-SDI, SD-SDI, DVB-ASI. Upgradeable to 128x128. Ethernet/RS-232/NCB control. 19" 8RU depth 5cm.
SL-3GHD9696-RC	96x96 HD-SDI Router (Multi rate, 270Mbps-2.970Gbps). Supports 3G-SDI, HD-SDI, SD-SDI, DVB-ASI. Upgradeable to 128x128. Ethernet/RS-232/NCB control. 19" 8RU depth 5cm.
SL-3GHD6496-RC	64x96 HD-SDI Router (Multi rate, 270Mbps-2.970Gbps). Supports 3G-SDI, HD-SDI, SD-SDI, DVB-ASI. Upgradeable to 128x128. Ethernet/RS-232/NCB control. 19" 8RU depth 5cm.
SL-3GHD9664-RC	96x64 HD-SDI Router (Multi rate, 270Mbps-2.970Gbps). Supports 3G-SDI, HD-SDI, SD-SDI, DVB-ASI. Upgradeable to 128x128. Ethernet/RS-232/NCB control. 19" 8RU depth 5cm.
SL-3GHD3296-RC	32x96 HD-SDI Router (Multi rate, 270Mbps-2.970Gbps). Supports 3G-SDI, HD-SDI, SD-SDI, DVB-ASI. Upgradeable to 128x128. Ethernet/RS-232/NCB control. 19" 8RU depth 5cm.
SL-3GHD9632-RC	96x32 HD-SDI Router (Multi rate, 270Mbps-2.970Gbps). Supports 3G-SDI, HD-SDI, SD-SDI, DVB-ASI. Upgradeable to 128x128. Ethernet/RS-232/NCB control. 19" 8RU depth 5cm.
SL-3GHD64+-RC	64x64 HD-SDI Router (Multi rate, 270Mbps-2.970Gbps). Supports 3G-SDI, HD-SDI, SD-SDI, DVB-ASI. Upgradeable to 128x128. Ethernet/RS-232/NCB control. 19" 8RU depth 5cm.
SL-3GHD3264+-RC	32x64 HD-SDI Router (Multi rate, 270Mbps-2.970Gbps). Supports 3G-SDI, HD-SDI, SD-SDI, DVB-ASI. Upgradeable to 128x128. Ethernet/RS-232/NCB control. 19" 8RU depth 5cm.
SL-3GHD6432+-RC	64x32 HD-SDI Router (Multi rate, 270Mbps-2.970Gbps). Supports 3G-SDI, HD-SDI, SD-SDI, DVB-ASI. Upgradeable to 128x128. Ethernet/RS-232/NCB control. 19" 8RU depth 5cm.
SL-3GHD32+-RC	32x32 HD-SDI Router (Multi rate, 270Mbps-2.970Gbps). Supports 3G-SDI, HD-SDI, SD-SDI, DVB-ASI. Upgradeable to 128x128. Ethernet/RS-232/NCB control. 19" 8RU depth 5cm.
SL-UPG-32IN	Upgrade to add 32x Inputs to your partly configured SL-3GHD128128-RC router.
SL-UPG-32OUT	Upgrade to add 32x Outputs to your partly configured SL-3GHD128128-RC router.
SL-UPG-32IN+OUT	Upgrade to add 32x Inputs and Outputs to your partly configured SL-3GHD128128-RC router.
Power Supply Unit	
SL-PWR-300	300W AC Power Supply Unit for Sublime 128 range. 48VDC output.

2 Specifications

2.1 Mechanics

Dimensions:	HxWxD = 355x483x50/100[1]mm, (19”, 8RU).
Router weight:	7.75 kg, including 1x PSU module (1.15 kg).
Router weight, optical I/O:	- Each 16x16 Optical I/O module weighs 0.20kg, without SFPs; - Each SFP weighs typically 17.5g.
Max. Power consumption:	+48V, 2.8A; 135W; Without Optical I/O.
Power consumption, optical I/O:	Each 16x16 Optical I/O module with SFPs inserted consumes maximum 20W, typically 7W in addition to above specification.
Safety/Emission standards:	Compliant with CE EN55103-1 and 2.

2.2 Power supply

SL-PWR-300:	300 W Power supply Unit.
AC Supply voltage range:	90-130VAC / 180-254VAC, switchable, 50-60Hz, 300W.
AC Mains connector:	IEC 320.
DC output:	+48V, max. 6.25A. Maximum 300 W.
DC connector:	DSUB 2V2P.
Status monitoring:	Via LED in front of the router.
Safety standards:	Compliant with CE EN60950, UL-1950/CSA22.2.

2.3 Control

Standard Features:

Serial port:	RS-232 for protocol conversion, to VikinX compact control protocol, or to third party protocols.
Connector:	DE9, D-sub 9-pin female.
NCB ports:	For integration with VikinX compact router configuration.
Connectors (2):	RJ45 (1 In / 1 Out)
Ethernet port:	10/100BaseT Ethernet bus for external router control.
Connector:	RJ45.
Reclocker option:	Bypass of reclocking (from system controller).
Input Equalizer option:	Bypass of input equalization (from system controller).
Synchronization:	- Analog Black&Burst, looped. Both PAL and NTSC supported. - Tri-Level, Looped. For HD signal formats only. - Distribution of synchronization signals between several routers.
Connector(s):	BNC.

2.4 Video specifications

Supported formats:

Telecom:	STM-1e and E4.
Broadcast:	- 270Mbps – 2.97Gbps. - 2K, 2048x1556/23.98 and 24.

Supported standards:

SD-SDI, 270Mbps:	SMPTE 259M.
HD-SDI, 1.485Gbps:	SMPTE 292-2008.
3G-SDI, 2.97Gbps:	SMPTE 424M.

[1] Frame depth is 50mm without optical I/O; with Optical I/O. frame depth is 100mm.

DVB-ASI: EN50083-9.
Fiber transmission: SMPTE 297-2006.

Optical signal inputs:

Sensitivity: -18dBm.
Detector overload threshold: 0dBm.
Detector damage threshold: >+1dBm.
Optical wavelength: 1260 – 1620nm.
Transmission circuit fiber: 9/125um single mode.
Connectors: LC/UPC.

Optical signal outputs:

Light source: FP laser.
Optical power: 0 to -5dBm, typ -2dBm.
Optical center wavelength: 1310nm.
Max. wavelength variation: +/-20nm.
Transmission circuit fiber: 9/125um single mode.
Connectors: LC/UPC.

Electrical signal inputs:

Connectors: BNC, IEC 61169-8.
Impedance: 75 Ohm.
Return loss:
- > 15dB (5 MHz – 1.485 GHz);
- > 10dB (1.5 – 3 GHz).

Cable equalization:
- Automatic up to 70m @ 2.97Gbps, typical Belden 1694A;
- Automatic up to 100m @ 1.485Gbps, typical Belden 1694A;
- Automatic up to 300m @ 270Mbps, typical Belden 8281.

Electrical signal outputs:

Connector: BNC, IEC 61169-8.
Impedance: 75 Ohm.
Return loss:
- > 15dB (5 MHz – 1.485 GHz);
- > 10dB (1.5 – 3 GHz).

Signal level: 800mVp-p ±10%.
Rise/fall time: 20% - 80%
- SD limit: 0.4ns – 1.5ns, < 0.5ns rise/fall variation;
- HD limit: < 270ps, < 100ps rise/fall variation;
- 3G limit: < 135ps, < 50ps rise/fall variation.

Amplitude overshoot: < 10%.
Signal polarity: Non-inverting electrical with respect to inputs.

Signal transition:

Timing jitter:
- SD: < 0.2 UI;
- 3G / HD: < 1 UI.

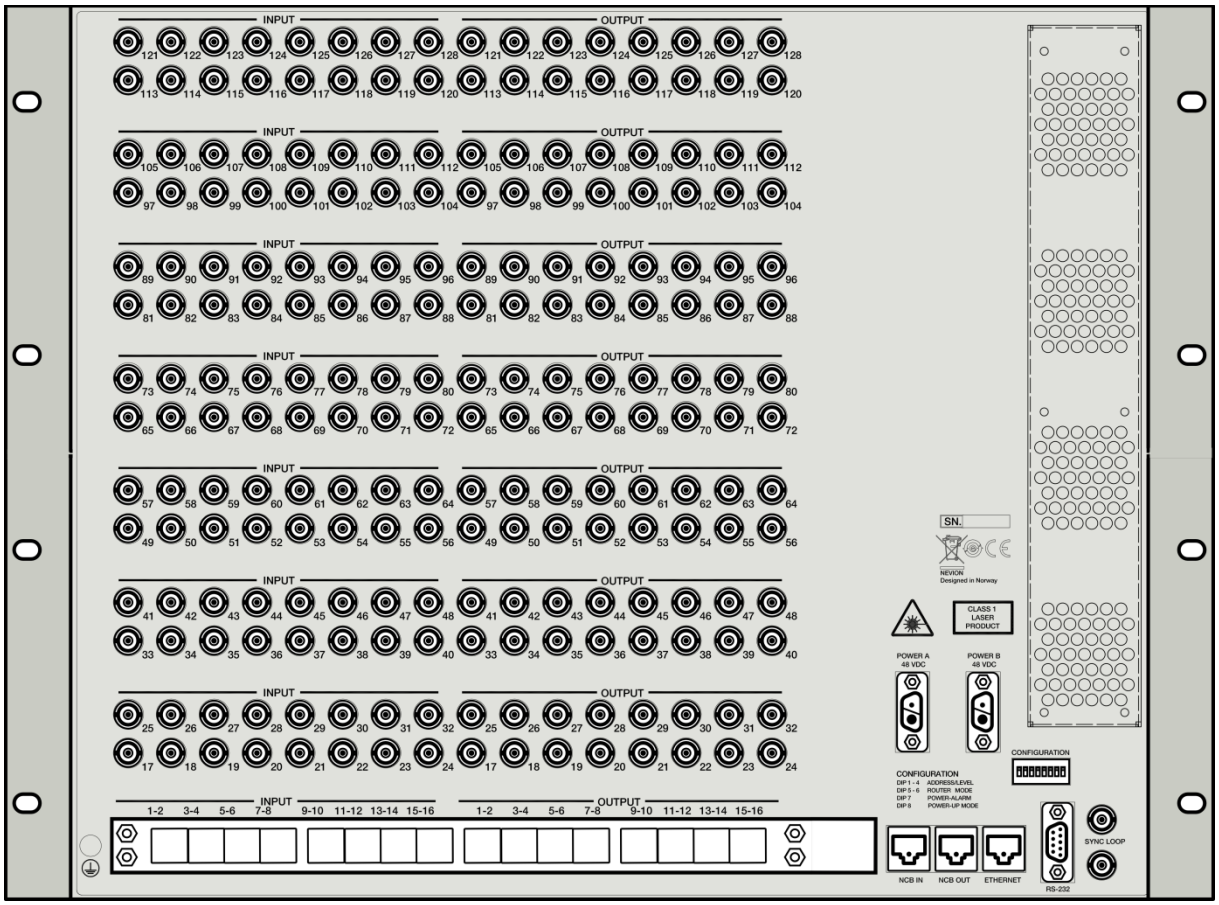
Alignment jitter:
- SD: < 0.2 UI;
- 3G / HD: < 0.2 UI.

Reference inputs:

Number of inputs: 1.
Connector: 75 ohm BNC female, loop-thru.
Return loss: >40dB (100 kHz – 5 MHz);
>35dB (5-10 MHz).
Signal format: NTSC or PAL Black&Burst or HD Tri-Level according to SMPTE 274M, SMPTE 276M.
Signal level: Nominal 1.0Vp-p.
Field selectivity: Field 1.

Timing range:
- HD Tri-Level: 1280x720: within clock-intervals (148.5 MHz) 455 – 780 line 7;
- HD Tri-Level: 1920x1080: within clock-intervals (148.5 MHz) 625 – 1070 line 7.

2.5 Rear view



The following service connectors can be found on the rear of the SL-3GHD128128-RC router:

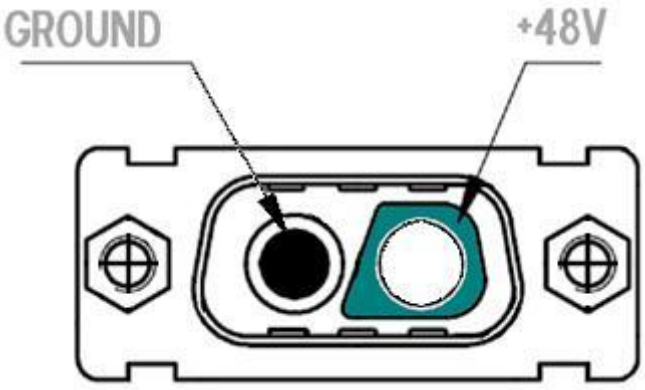
Power A (48 VDC): +48 VDC power connector[2].
Power B (48 VDC): +48 VDC power connector (if redundant supply is installed)[3].
RS 232: RS-232 port for external control protocols.
Ethernet: 10/100Base-T Ethernet bus for external router control.
NCB IN: Network Control Bus Input. The protocol of this bus is described in a separate manual.
NCB OUT: Network Control Bus Output.
Sync/Loop: Synchronization signal (in/out). Black&Burst/composite/tri-level sync reference input with passive loop-through for vertical interval switching.
Configuration: Configurations switch. See Chapter 3 for further descriptions.

[2] Note that any VDC supplies with output voltage between +36VDC and +72 VDC, with sufficient power, may be applied to the router.
[3] The router is supplied with inverse diodes. This means that in a redundant power supply application the router will pull its entire load from the PSU with the highest output voltage.

2.5.1 Power Supply pinout

The DSUB 2V2P power pinout for Sublime routers and Control Panels are as follows;

Pin #	Description
Socket	+48VDC
Pin	GND



There is a switch on the right hand side of the power supply module that selects mains voltage. The mains voltage can be either 110VAC or 230VAC. This switch must be set in the correct position, depending on the mains voltage on the router's site.

Failing to select correct AC mains voltage properly may damage the Power Supply Unit.

2.5.2 Serial port pinout

The DE9, D-sub 9-pin female connectors for the serial port(s) of the router have the following pin-out:

Pin #	RS-232 signal
1	*Not in use*
2	Tx
3	Rx
4	*Not in use*
5	GND
6	GND
7	RTS
8	CTS
9	*Do Not Connect!*

Note that if the standard RS-232 cable specification (DCE) is followed:

- a cable with Male+Male or Female+Female connectors at the cable ends is used for Rx/Tx crossed connection, and
- a cable with Male+Female connectors at the cable ends is used for a straight through connection.

3 Configuration

This chapter provides an overview of the configuration options that are available on the SL-3GHD128128-RC router.

Some of the configuration options demand software configuration, using the Nevion Configurator. This tool is supplied with each router, but can also be downloaded from our web site: www.nevion.com/support

> It is important that users apply Nevion Configurator v4.1.1 (or a higher version number) when configuring the SL-3GHD128128-RC and its variants.

3.1 Power Supply setup

Before proceeding with router configuration, make sure the accompanying power supply unit is configured for the right AC supply voltage.

There is a switch on the rear side of the power supply module that selects mains voltage. The mains voltage can be either 110VAC or 230VAC.

This switch *must* be set in the correct position, depending on the mains voltage on the router's site.

> Failing to select correct AC mains voltage properly may damage the Power Supply Unit.

3.2 Router level

Switches 1 - 4 on the configuration switch set the router's level for communication with the Router Management System and other units in the NCB system. The panels on the NCB dedicated to operate with the router must be configured to the same level as that router.

If several routers are combined to form an Audio Follow Video, RGB or similar system, these routers must be configured to the same level.

The levels can be switched according to the following pattern:

SW 1	SW 2	SW 3	SW 4	Level	NCB Address
OFF	OFF	OFF	OFF	1	0
OFF	OFF	OFF	**ON**	2	1
OFF	OFF	**ON**	OFF	3	2
OFF	OFF	**ON**	**ON**	4	3
OFF	**ON**	OFF	OFF	5	4
OFF	**ON**	OFF	**ON**	6	5
OFF	**ON**	**ON**	OFF	7	6
OFF	**ON**	**ON**	**ON**	8	7
ON	OFF	OFF	OFF	9	8
ON	OFF	OFF	**ON**	10	9
ON	OFF	**ON**	OFF	11	10
ON	OFF	**ON**	**ON**	12	11
ON	**ON**	OFF	OFF	13	12
ON	**ON**	OFF	**ON**	14	13
ON	**ON**	**ON**	OFF	15	14
ON	**ON**	**ON**	**ON**	16	15

Default level is 1.

3.3 Router mode

SL-3GHD128128-RC allows switching in different modes:

Router layers	Layer sizes
1 layer	128x128
2 layers	64x64
3 layers	42x42
4 layers	32x32

Switches 5 - 6 on the configuration switch set the router's mode. The Router Management System software must be configured according to the chosen setup.

The modes can be switched according to the following pattern:

SW 5	SW 6	Router mode
OFF	OFF	1 router layer
OFF	**ON**	2 router layers
ON	OFF	3 router layers
ON	**ON**	4 router layers

Default mode is 1 router layer.

Based on the configuration above, the I/O is connected to the router according to the following scheme:

- **1 layer:**
  I/O is connected according to information on the rear of the router.
- **2 layers:**

Layer 1	Input	Layer 1	Output
1	1	1	1
2	2	2	2
3	3	3	3
…	…	…	…
64	64	64	64
Layer 2	**Input**	**Layer 2**	**Output**
1	65	1	65
2	66	2	66
3	67	3	67
…	…	…	…
64	128	64	128

- **3 layers:**

Layer 1	Input	Layer 1	Output
1	1	1	1
2	2	2	2
3	3	3	3
…	…	…	…
42	42	42	42
Layer 2	**Input**	**Layer 2**	**Output**
1	43	1	43
2	44	2	44
3	45	3	45
…	…	…	…
42	84	42	84
Layer 3	**Input**	**Layer 3**	**Output**
1	85	1	85
2	86	2	86

3	87	3	87
…	…	…	…
42	126	42	126

In-/Outputs 127 and 128 are not in use in this router setup (3 layers).

– **4 layers:**

Layer 1	**Input**	**Layer 1**	**Output**
1	1	1	1
2	2	2	2
…	…	…	…
32	32	32	32
Layer 2	**Input**	**Layer 2**	**Output**
1	33	1	33
2	34	2	34
…	…	…	…
32	64	32	64
Layer 3	**Input**	**Layer 3**	**Output**
1	65	1	65
2	66	2	66
…	…	…	…
32	96	32	96
Layer 4	**Input**	**Layer 4**	**Output**
1	97	1	97
2	98	2	98
…	…	…	…
32	128	32	128

3.4 External power alarm

The external power alarm can be switched according to the following pattern:

SW 7	**Power alarm**
OFF	Disables External Power Alarm
ON	Enables External Power Alarm

Default setting is External Power Alarm disabled.

3.5 Power-up mode

Switch 8 on the configuration switch defines the power up mode. The sublime router provides two modes for powering up the system.

The power up options can be switched according to the following pattern:

SW 8	**Power Up mode**
OFF	Switches all outputs according to the buffered information in the routers processor system.
ON	Switches all outputs to input 1.

Default setting switches all outputs according to the buffered information in the routers processor system.

3.6 Configuring switching time

This configuration is done in the Nevion Configurator.

It is possible to configure switching time in the router. The settings are made through the Nevion Configurator, but a description of the options is given here. The user can select between three options;

1. Switch according to detected sync reference signal (Default).
   Switching time is determined by the synchronization signal that feeds the router. This is useful when the video signal has the same format as the synchronization signal.
   Supported formats are: PAL, NTSC, 750/50p, 750/60p, 1125/50i and 1125/60i.
2. Switch according to signal format: Select format.
   Here it is possible to use one synchronization signal to switch a different video format. A prerequisite is that the synchronization signal and the video signal have the same frame rate. E.g. Use PAL as synchronization signal with a 750/50p video signal. Supported formats are: PAL, NTSC, 750/50p, 750/60p, 1125/50i, 1125/60i, 1125/50p and 1125/60p.

   We do not support 1125/50p or 1125/60p as synchronization signal. This means that our 3G-HD routers cannot use default setting.

3. Switch to handle mixed signal formats.
   The router switches 12us after vertical sync on the synchronization signal. This will occur in line 1 on all video formats. This is useful when you have different video formats on the same router, also with different frame rate.

   This setting is not according to recommendations in SMPTE RP 168-2002. Embedded data may become damaged or lost.

3.7 Configuring protocol options

For various reasons, Nevion has decided to make it possible to turn the extra commands that were added to the NCB protocol when we introduced the Sublime router range either off or on.

At the same time, the user must select whether he/she shall use the RS-232 port for controlling the router or the Ethernet port. This is done in order to prevent both ports from simultaneously being applied for controlling the router.

There is a new Protocol field in the Nevion Configurator where you may choose from the following options;

- **NCB without Sublime ext. (RS232)**
  This is the “old” Compact NCB protocol, without Sublime extensions. If used on a Sublime, it also disables the Ethernet port of that device.
- **NCB (RS232)**
  This is the regular Sublime protocol, with the extra commands that were added to the NCB protocol. If used on a Sublime, it also disables the Ethernet port of that device.
  This is the default option for the *Sublime* (SL) range of products.

  This protocol is similar to the *Triton* protocol, allowing users to connect the Sublime device to a *Jupiter VM 3000 System Controller*.

- **MRP (TCP/IP)**
  This option is only applicable to the Sublime range. It selects the Ethernet protocol as the control option, and disables the RS-232 port of that device.

  MRP is always enabled when any TCP/IP based protocol is selected. This makes it possible to use Sublime panels when a third party protocol is selected.

– **Leitch Pass-Through (RS-232)**
This option allows support for Leitch Pass-Through protocol via RS-232 interface. The details of this protocol are described in *Leitch Routing Switchers Serial Protocol Reference, Edition E*. See also Appendix B.1 for details.

> This option is not supported over NCB.

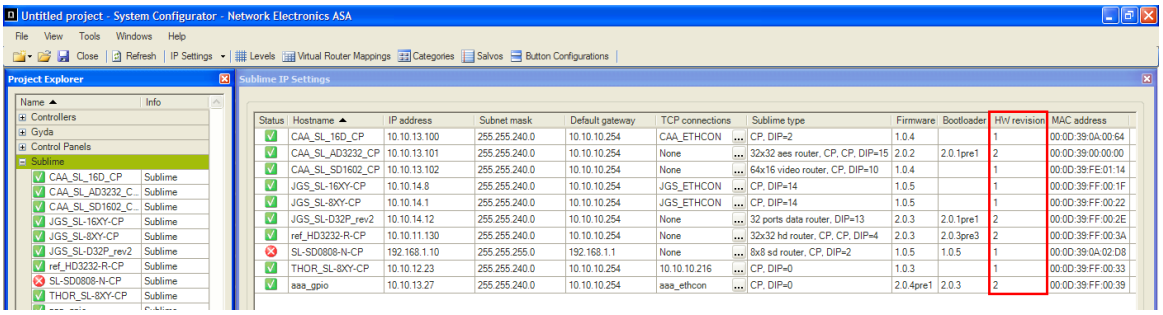
– **Leitch Pass-Through (TCP/IP)**
This option allows support for Leitch Pass-Through protocol via TCP/IP interface. The details of this protocol are described in *Leitch Routing Switchers Serial Protocol Reference, Edition E.*
The interface is using port 23 for this protocol option; same port as for Telnet applications. See also Appendix B.1 for details.

> The Leitch Pass-Through selections are only available on Sublime routers with FW version 2.4.x and higher.

– **Grass Valley Native protocol (TCP/IP)**
This option allows support for Grass Valley Native protocol via TCP/IP interface, using port 12345. The subset of this protocol that is supported by Sublime routers is described in Appendix B.2.

> The Grass Valley Native protocol is only available on Sublime routers with FW version 2.5.4 and higher.

Use your Nevion Configurator to verify the HW revision of your Sublime unit:


Untitled project - System Configurator - Network Electronics ASA
File View Tools Windows Help
Close Refresh IP Settings Levels Virtual Router Mappings Categories Salvos Button Configurations
Project Explorer
Name Info
Controllers
Gyda
Control Panels
Sublime
CAA_SL_16D_CP Sublime
CAA_SL_AD3232_C... Sublime
CAA_SL_SD1602_C... Sublime
JGS_SL-16XY-CP Sublime
JGS_SL-8XY-CP Sublime
JGS_SL-D32P_rev2 Sublime
ref_HD3232-R-CP Sublime
SL-SD0808-N-CP Sublime
THOR_SL-8XY-CP Sublime
Sublime IP Settings
Status Hostname IP address Subnet mask Default gateway TCP connections Sublime type Firmware Bootloader HW revision MAC address
CAA_SL_16D_CP 10.10.13.100 255.255.240.0 10.10.10.254 CAA_ETHCON ... CP, DIP=2 1.0.4 1 00:0D:39:0A:00:64
CAA_SL_AD3232_CP 10.10.13.101 255.255.240.0 10.10.10.254 None ... 32x32 aes router, CP, CP, DIP=15 2.0.2 2.0.1pre1 2 00:0D:39:00:00:00
CAA_SL_SD1602_CP 10.10.13.102 255.255.240.0 10.10.10.254 None ... 64x16 video router, CP, DIP=10 1.0.4 1 00:0D:39:FE:01:14
JGS_SL-16XY-CP 10.10.14.8 255.255.240.0 10.10.10.254 JGS_ETHCON ... CP, DIP=14 1.0.5 1 00:0D:39:FF:00:1F
JGS_SL-8XY-CP 10.10.14.1 255.255.240.0 10.10.10.254 JGS_ETHCON ... CP, DIP=14 1.0.5 1 00:0D:39:FF:00:22
JGS_SL-D32P_rev2 10.10.14.12 255.255.240.0 10.10.10.254 None ... 32 ports data router, DIP=13 2.0.3 2.0.1pre1 2 00:0D:39:FF:00:2E
ref_HD3232-R-CP 10.10.11.130 255.255.240.0 10.10.10.254 None ... 32x32 hd router, CP, CP, DIP=4 2.0.3 2.0.3pre3 2 00:0D:39:FF:00:3A
SL-SD0808-N-CP 192.168.1.10 255.255.255.0 192.168.1.1 None ... 8x8 sd router, CP, DIP=2 1.0.5 1.0.5 1 00:0D:39:0A:02:D8
THOR_SL-8XY-CP 10.10.12.23 255.255.240.0 10.10.10.254 10.10.10.216 ... CP, DIP=0 1.0.3 1 00:0D:39:FF:00:33
aaa_gpio 10.10.13.27 255.255.240.0 10.10.10.254 aaa_ethcon ... CP, DIP=0 2.0.4pre1 2.0.3 2 00:0D:39:FF:00:39

> Right-click the column headers and select the appropriate column to be shown, if you don't see the appropriate column in your default display.

For further information about FW releases, please go to the Nevion web site to download, or check available FW releases: www.nevion.com.

3.8 Configuring Input options

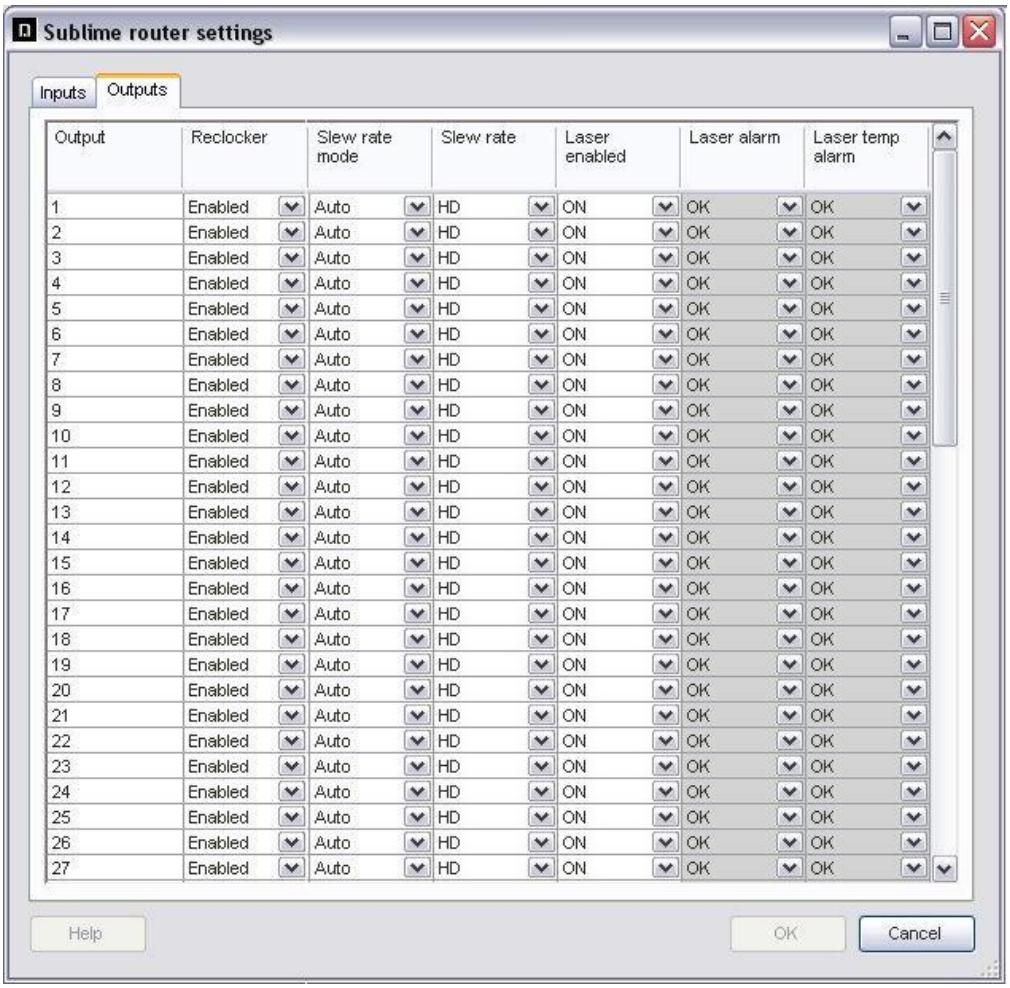
> This configuration is done in the Nevion Configurator.

3.8.1 Input EQ

It is possible to enable, or bypass, Input EQ for each router input separately. Default is Input EQ enabled.

3.9 Configuring Output options

> This configuration is done in the Nevion Configurator.



3.9.1 Output reclocker

It is possible to enable, or bypass, Output Reclocker for each router output separately. Default is Output Reclocker enabled.

3.9.2 Slew rate settings

3.9.2.1 Slew rate mode

Set slew rate mode on output (Auto / Fixed).

> Automatic slew rate detection is only available on reclocking routers. Non-reclocking routers can only set the options based on Fixed slew rate mode.

3.9.2.2 Slew rate

Set slew rate to SD or HD. Only used when Slew rate mode is fixed.

3.9.3 Laser settings

> This is only applicable on Sublimes with optical I/O.

3.9.3.1 Laser enabled

Enable or disable laser; (ON / OFF). It is useful to disable a laser, for safety purposes, if maintenance is required on the receiving end of the fiber.

3.9.3.2 Laser alarm

Indicates alarm on laser; (OK / FAIL).

3.9.3.3 Laser temp alarm

Indicates high temperature alarm on laser; (OK / FAIL).

4 LED status indication

4.1 Start-up

The LED located at the front of the router indicates the status of the router. At start-up, the LED will alternate between red (R) and green (G) every 500ms for about two seconds. After the start-up sequence the LED will indicate the Alarm state of the router.

There are two LEDs located at the Ethernet bus. At start-up the boot loader is searching for update commands on the serial port for about two seconds. During this sequence both Ethernet LEDs will be blinking. After the start-up sequence the LEDs will indicate the Ethernet state.

4.2 Alarm states

The LED can either be red (R), green (G), yellow (Y) or have no light (N).

The LED state is here described with twenty letters, each representing 100ms, which totals to an alarm sequence of two seconds. The X indicates that the LED keeps the color it has the moment the alarm sequence begins (green, yellow or no light).

Description	LED state	Alarm	Comment
Continuous green light	GGGGG GGGGG GGGGG GGGGG	No alarm. Status is OK.	
Continuous yellow light	YYYYY YYYYY YYYYY YYYYY	Unable to connect to controller over Ethernet.	This alarm will be overwritten by other alarms
Long red blinks	RRRRR NNNNN RRRRR NNNNN	Power is too low.	
One short red blink	RXXXX XXXXX XXXXX XXXXX	Power A failed	Only active if power alarm dip is set.
Two short red blinks	XXXXX XXXXX RXRXX XXXXX	Power B failed	Only active if power alarm dip is set.
Red with one short yellow blink	YRRRR RRRRR RRRRR RRRRR	No valid product key.	
Red with two short yellow blinks	YRYRR RRRRR RRRRR RRRRR	SFP error.	Only used on routers with optical modules.
Red with three short yellow blinks	YRYRY RRRRR RRRRR RRRRR	Fan error	

4.3 Ethernet states

The LEDs that are located at the Ethernet bus will after the Start-up sequence indicate the Ethernet states:

	On	Off / Blinking
Green	Valid link	No link
Yellow	No data	Data is transmitted or received

5 Router communication

You gain access to router for communication purposes by connecting either the router's serial port to your computer or by using an Ethernet connection.

> Do not use both the router's Ethernet port and RS-232 serial port, or NCB ports, at the same time. Doing so may cause loss of important communication and control data.

5.1 Serial connection

Connection can be made through the serial port of the router; see also Chapter 2.5.2 for connection details.

The communication parameters are configurable. Please refer to the protocol documentation of the appropriate communication/control protocol.

Example: The protocol parameters of the *VikinX Compact routers* are as follows:

- Bit rate 19200 bit/s
- Data bits 8 bits
- Stop bits 1
- Parity: No parity

For further details concerning this protocol, please refer to the following manual:

NCB Protocol.pdf.

The DE9 female socket for the serial port of the router has the following pin-out:

Pin #	RS-232 mode
1	*Not in use*
2	Tx
3	Rx
4	*Not in use*
5	GND
6	GND
7	RTS
8	CTS
9	*Do Not Connect!*

> Note that if the standard RS-232 cable specification (DCE) is followed:
>
> A cable with Male+Male or Female+Female connectors at the cable ends is used for Rx/Tx crossed connection, and
>
> A cable with Male+Female connectors at the cable ends is used for a straight through connection.

5.1.1 Maximum cable length (RS-232)

IEEE has specified the maximum cable length for an RS-232 connection to 15m. Longer distances can be installed depending on the environmental conditions of the installation site.

> It is the responsibility of the installer / user to secure a proper installation of the RS-232 connection.

5.2 Ethernet connection

The connections follow the standard set by the IEEE 802.3 100BaseTX specification. The cables that are to be applied should be CAT-5 / CAT-5E standard, or better. It is the responsibility of the installer / user to secure a proper installation of the Ethernet connection.

All VikinX Sublime routers and IP-based Control Panels are connected together through an Ethernet Switch.

A VikinX Sublime device has only one physical Ethernet connection. If redundant control is required, this limitation has to be solved by the control system.

For Ethernet protocol details concerning this router, please refer to the following manual: Modular Router Control Protocol. This manual can be found on our web site: http://www.nevion.com.

5.2.1 HW limitations

The user has the option of connecting more than two devices together, without having a Multicon to control the network. However, unless you apply a Multicon as a system controller, the limitations that apply are:

1. One Sublime control panel may connect to a maximum of 4 Sublime routers.
2. One Sublime router may be controlled by a maximum of 4 Sublime control panels.

> Exceptions to the above limitations:
>
> A router with a local CP (e.g. SL-V6464-CP) may only connect to 1 other router. Both routers must be configured with the same address and be of different type (A+V).
>
> Example: 1x SL-V6464-CP may only control itself + 1x Audio router (AA or AES). Both routers must be configured with the same address.
>
> 16x2 routers that are expanded to NNx2 are using the NCB bus for this purpose. The total NNx2 router is therefore counted as 1 router in the limitations 1 and 2 above.

From limitations 1 and 2 above, the resulting Ethernet configuration may consist of maximum 8 devices; 4 routers and 4 control panels, with the exceptions mentioned above. An example is illustrated in the figure below.

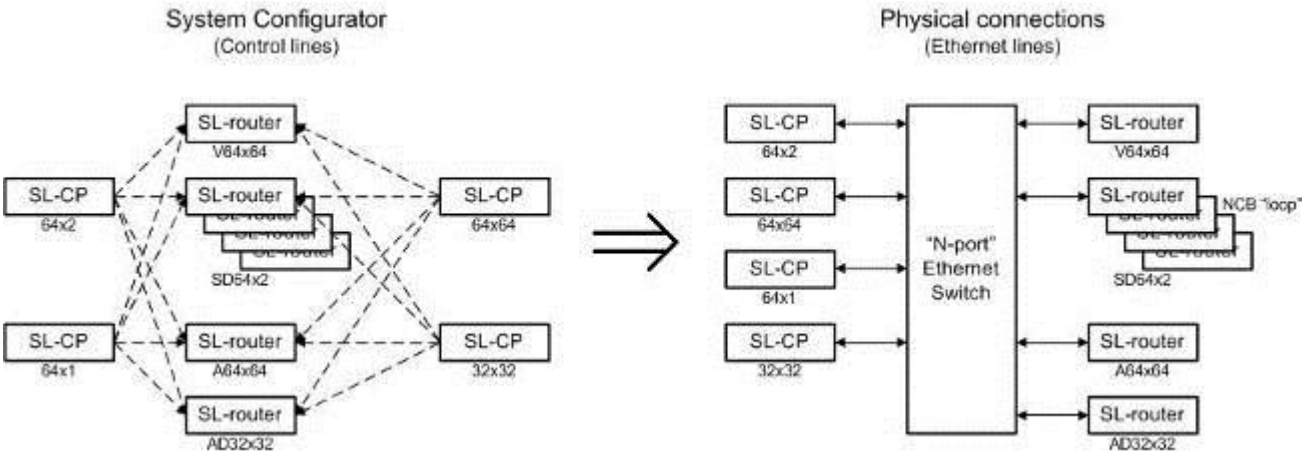


Figure 1: Ethernet connections and configuration.

> Refer to the Nevion Configurator User Manual for further information about the above described configuration/connection options.

5.3 NCB connection

Via the Network Control Bus system several routers and control panels can be interconnected.

Up to 16 levels of routers, or combinations of routers, can be controlled. The NCB system and all RS 232 ports interchange the system status. This means that any control system, either from Nevion, or from a third party manufacturer, connected to any RS 232 port in the NCB loop, will have access to all communication data on the bus.

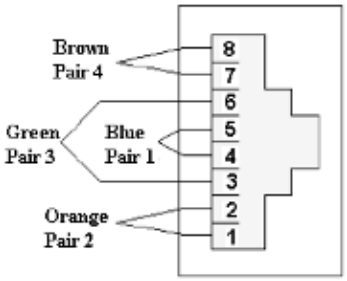
5.3.1 Connecting control panels

To get a control panel working with a specific router, configure the control panel to the same level as the router. Several panels can be configured to control the same router. Panels can also be connected to a router via the RS-232 interface. Please refer to your control panel manual for installation.

5.3.2 Pin-out and cable type

VikinX Sublime routers and Control Panels use RJ45 connectors for the Network Control Bus ports. The following pin-out is used:

Pin #1	Not Connected
Pin #2	Not Connected
Pin #3	Data (retour)
Pin #4	Data
Pin #5	Data
Pin #6	Data (retour)
Pin #7	Not Connected
Pin #8	Not Connected



The following connection example shows connection of 4 VikinX devices with RJ45 connectors and bus termination:

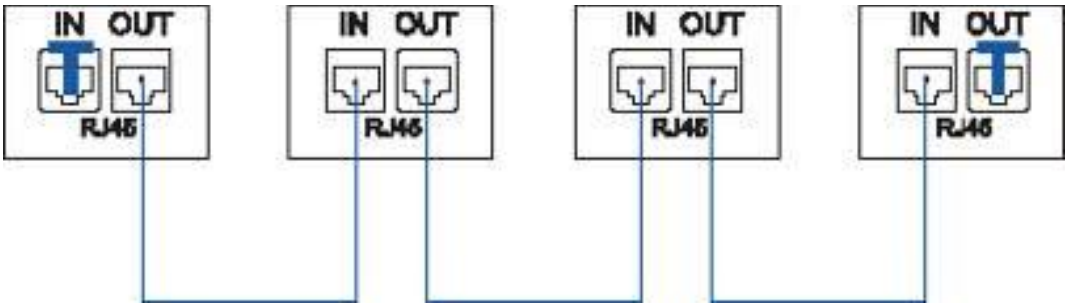


Figure 2: NCB loop configuration.

Note that each device at the end of the chain has a termination plug, indicated with the letter “T”. This termination plug must be inserted in the correct connection port. If not, no NCB communication is possible.

5.3.3 Termination plug

The termination plug that is mentioned in the previous chapter is necessary when you want to avoid closing the loop be a (long) cable.

The termination plug is a standard RJ45 plug with the following internal wiring:

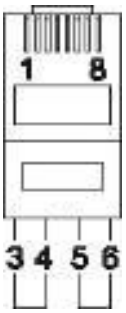


Figure 3: NCB loop termination plug.

As seen in the figure above, *Pin 3* is connected to *Pin 4*, and *Pin 5* is connected to *Pin 6*.

5.3.4 Control bus structure

The Network Control Bus structure follows the standard MIDI bus definition. The NCB is defined as a closed chain of units. This means that the NCB OUT of the last unit must be connected to the NCB IN of the first unit in the NCB chain. To avoid problems with the control of VikinX units the installer/user has to assure that the bus structure is installed according to this definition.

The total number of VikinX devices in an NCB chain is limited to 50.

5.3.5 Maximum distance between NCB devices

The standard MIDI definition allows a maximum cable length of 200-250 meters between two devices. Longer distances can be made with MIDI repeater units. To avoid grounding problems all NCB ports have opto-coupled inputs.

6 Connecting signal cables to the router

6.1 Optical interface

Sublime Optical offers dual SFPs with LC/UPC connectors for optical video I/O.

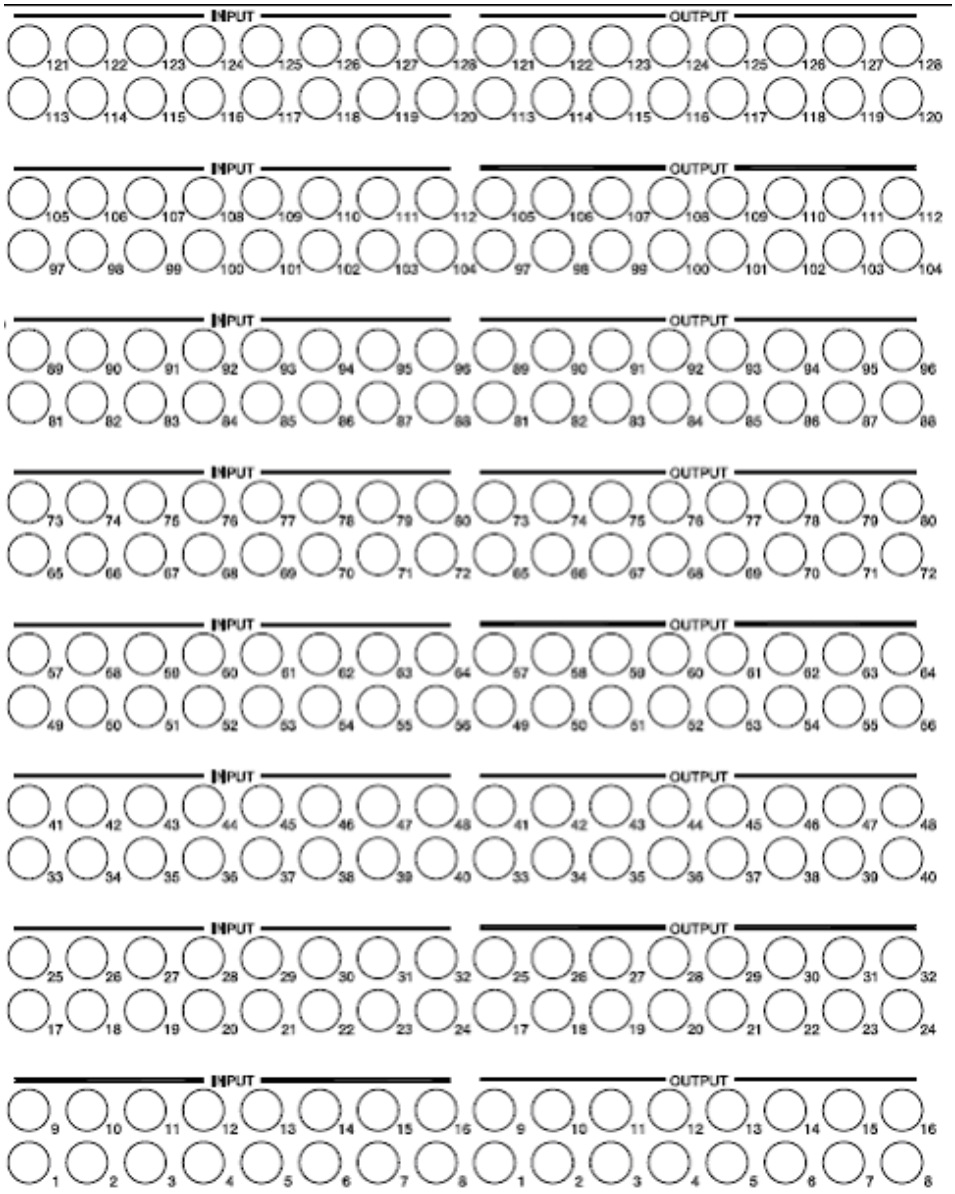
> Optical I/O starts from I/O #1 and up, in blocks of 16 I/O.

This means that routers with both electrical and optical I/O always start with all the optical I/O first, followed by the electrical I/O.

6.2 Electrical interface

> This chapter is only applicable for routers that have electrical I/O for parts of the available video I/O.

The SL-3GHD128128-RC router offers standard 75Ohm BNC connectors for electrical video I/O. All video inputs are terminated with 75Ohm. See also Chapters 2.4 and 2.5 for more details. The figure below shows the I/O numbering.



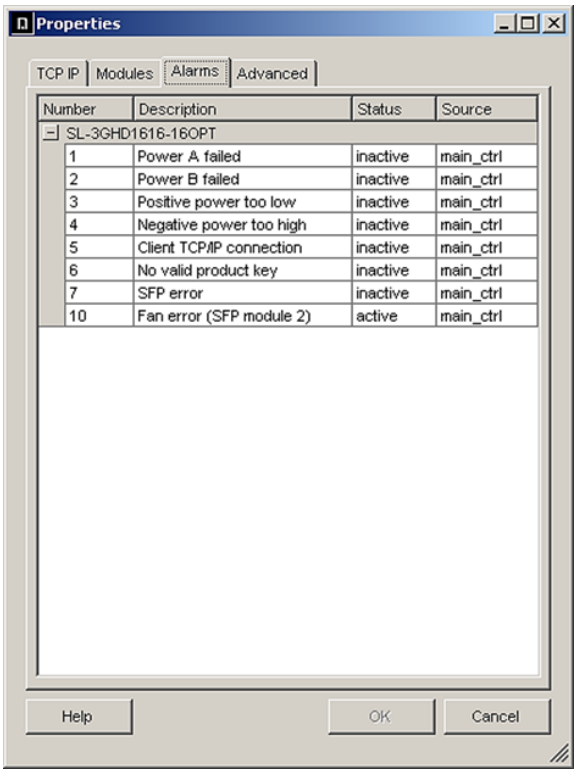
7 Fan monitoring and replacement

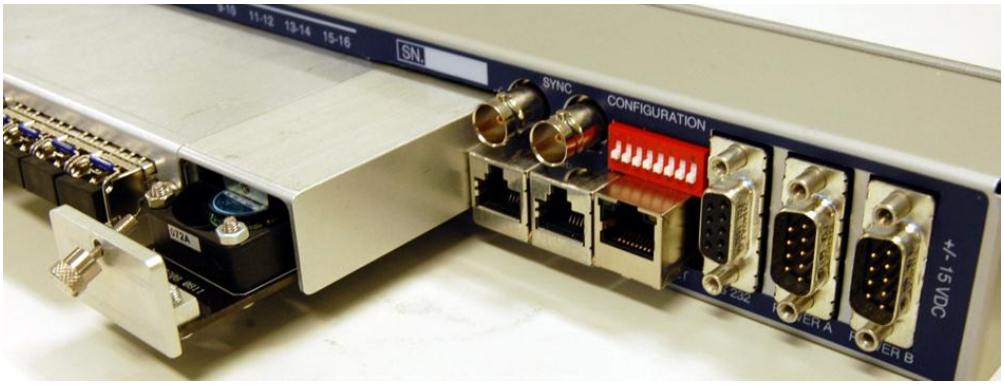
This chapter only applies on routers with optical interface.

Each optical backplane module has a fan which is monitored. If the fan fails, the LED in front of the Sublime will indicate an error, see chapter 4.2 – Alarm states.

It is also possible to use Nevion Configurator to list all alarms. In “System Overview”, right-click on the Sublime unit and select “Properties”, then choose the “Alarms” tab. If a fan error alarm is active, the alarm description will include the number of all optical backplane modules with a faulty fan. The number is counting from the bottom giving the lowest module number 1, the next number 2 and so on.

The fan module is mounted to the optical backplane module with a single screw. When replacing a faulty fan module, loosen the screw by hand or by using a flat screwdriver. New fan modules can be ordered separately.





General environmental requirements for Nevion equipment

1. The equipment will meet the guaranteed performance specification under the following environmental conditions:
   - Operating room temperature range: 0°C to 45°C
   - Operating relative humidity range: <95% (non-condensing)

2. The equipment will operate without damage under the following environmental conditions:
   - Temperature range: -10°C to 55°C
   - Relative humidity range: <95% (non-condensing)

Product Warranty

The warranty terms and conditions for the product(s) covered by this manual follow the General Sales Conditions by Nevion, which are available on the company web site:

www.nevion.com

Important notes regarding Software in the VikinX Sublime router family range

This product utilizes software components that are licensed with open source licenses. The source code for these components and our modifications are available from: http://labs.nevion.com/open-source/

OpenTCP includes software developed by Viola systems (http://www.violasystems.com/).

Appendix A Materials declaration and recycling information

A.1 Materials declaration

For product sold into China after 1st March 2007, we comply with the “Administrative Measure on the Control of Pollution by Electronic Information Products”. In the first stage of this legislation, content of six hazardous materials has to be declared. The table below shows the required information.

Part Name	Toxic or hazardous substances and elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (Cr(VI))	Polybrominated biphenyls (PBB)	Polybrominated diphenyl ethers (PBDE)
SL-3GHD128128-RC	O	O	O	O	O	O
SL-PWR-300	O	O	O	O	O	O
O: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006. X: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T11363-2006.						

Parts without any of the above mentioned hazardous substances are indicated by the product marking:

A.2 Recycling information

Nevion provides assistance to customers and recyclers through our web site http://www.nevion.com/. Please contact Nevion’s Customer Support for assistance with recycling if this site does not show the information you require.

Where it is not possible to return the product to Nevion or its agents for recycling, the following general information may be of assistance:

- Before attempting disassembly, ensure the product is completely disconnected from power and signal connections.
- All major parts are marked or labeled to show their material content.
- Some circuit boards may contain battery-backed memory devices.

Appendix B Additional Protocol information

B.1 Leitch Pass-Through protocol

This protocol is available in Sublime firmware 2.4.0 and later.

The Sublime implementation of Leitch Pass-Through supports all commands described in "Leitch Routing Switchers Serial Protocol Reference, Edition E".

In the command "Alarms Status Request", a bit-field is used for reporting active alarms. In Sublime, the bit-field is used as in the table below.

Bit	Description	Reported from firmware version
0	Power A failed	2.4.0
1	Power B failed	2.4.0
2	Positive power too low	2.4.0
3	Negative power too high	2.4.0
4	Client TCP/IP connection failed	2.4.0
5	No valid product key	2.4.0
6	SFP error	2.4.0
7	EXT IN not locked	2.5.4
8	EXT IN CRC error counting	2.5.4
9	Fan error	2.6.2

B.2 Grass Valley Native protocol

This protocol is available in Sublime firmware 2.5.4 and later.

Sublime does not support all commands available in this protocol. The supported commands are described in the table below.

<table>
<tr><th>Command</th><th>Parameter</th><th colspan="3">Comments</th></tr>
<tr><td rowspan="2">BK - Background Activities</td><td>E - Echo</td><td colspan="3">BK,E and BK,E,ON and BK,E,OFF are all accepted and will be responded with ER,00,BK.</td></tr>
<tr><td>R - Protocol Processor Software Revision #</td><td colspan="3">Will be responded with KB,R,<firmware version>,</td></tr>
<tr><td>TJ - Request Take Index With Level Bitmap</td><td></td><td colspan="3">Each command supports only one X-point.</td></tr>
<tr><td>TI - Request Take Index With Level Index</td><td></td><td colspan="3">The optional level Index is not supported. The command can only be used to switch all levels.</td></tr>
<tr><td rowspan="5">QH - Query alarm status</td><td rowspan="5">AC - Query active alarm status</td><td colspan="3">Sublime has defined the alarms defined in the table below. All active alarms will be responded on this request.</td></tr>
<tr><td>Alarm ID</td><td>Alarm Name</td><td>Alarm Parameter</td></tr>
<tr><td>0x0101</td><td>Frame Fan</td><td>Fan number</td></tr>
<tr><td>0x0105</td><td>Power-supply</td><td>01 - Power A failed
02 - Power B failed</td></tr>
<tr><td>0x010A</td><td>Positive power too low</td><td>Always 00</td></tr>
</table>

		0x010B	Negative power to high	Always 00
		0x010C	Client TCP/IP connection failed	Always 00
		0x010D	No valid product key	Always 00
		0x010E	SFP error	Always 00
		0x010F	EXT IN not locked	Always 00
		0x0110	EXT IN CRC error counting	Always 00
QN - Query Names	L - Level			
	IS - Sources with source indexes	On SL-D32P+ the next available source will be labeled "DISCONNECT" and used to disconnect destinations.		
	ID - Destinations with destination indexes			

EC Declaration of Conformity

MANUFACTURER	Nevion	
AUTHORIZED REPRESENTATIVE (Established within the EEA)	Not applicable	
MODEL NUMBER(S)	All Products referred to in Chapter 1.1	
DESCRIPTION	VikinX Sublime 128x128 3G/HD/SD-SDI Router	
DIRECTIVES this equipment complies with	Low voltage (EU Directive 2006/95/EC) EMC (EU Directive 2004/108/EC) RoHS (EU Directive 2002/95/EC) China RoHS[4] WEEE (EU Directive 2002/96/EC) REACH	
HARMONISED STANDARDS applied in order to verify compliance with Directive(s)	EN 55103-1:1996 EN 55103-2:1996 EN 60950-1:2006	
TEST REPORTS ISSUED BY	**Notified/Competent Body**	**Report no:**
TECHNICAL CONSTRUCTION FILE NO	Not applicable	
YEAR WHICH THE CE-MARK WAS AFFIXED	2012	
TEST AUTHORIZED SIGNATORY		
MANUFACTURER	**AUTHORIZED REPRESENTATIVE (Established within EEA)**	**Date of Issue** 2012-02-20
	Not applicable	**Place of Issue** Sandefjord, Norway
Name Thomas Øhrbom		
Position VP of Business Support Systems, Nevion (authorized signature)		

[4] Administration on the Control of Pollution Caused by Electronic Information Products

Nevion HQ:
Nevion Europe, P.O. Box 1020, 3204 Sandefjord, Norway
Tel: +47 33 48 99 99 – Fax: +47 33 48 99 98 – www.nevion.com